REMARKS — General

By the above amendment, applicant has amended the title to emphasize the novelty and unobviousness of the invention. Applicant has also amended the specification, including the summary and the abstract so that they better correspond to the invention and the claims.

Applicant has canceled claims 1-17 and 29-43 and replaced them as indicated below.

With respect to claims 1-17, he has replaced these with new claims 44-65. In particular, he has rewritten claims 7 and 15 as two independent claims, namely claims 44 and 56, as suggested in the Office Action. He has thus canceled claim 1 and incorporated it in claims 44 and 56. As a consequence, he has rewritten claims 2-6 as claims 45-49 and also as claims 57-61. He has rewritten claims 8-12 as claims 50-54, claims 13-14 as claims 62-63, claim 16 as claim 64, and claim 17 as claims 55 and 65.

With respect to claims 29-39, he has rewritten these as new claims 66-94. In particular, he has rewritten claim 29 as two independent claims, namely claims 66 and 80. Applicant has split claim 29 into two independent claims, 66 and 80, to distinguish more clearly over the prior art. Applicant has canceled claim 30 and incorporated its subject matter in claim 80. And he has incorporated claim 32 in claims 66 and 80. As a consequence, he has rewritten claim 31 as claims 67 and 81. He has rewritten Claims 33-38 as claims 68, 69, 71, 74, 77, and 78 and also as claims 82, 83, 85, 89, 92, and 93. And he has rewritten claim 39 as claims 79 and 94. Furthermore, he has added claim 73 to explain and reify independent claim 66. He has added claims 76, 87, and 91 to recite other elements of the invention. And he has added claims 70, 72, 75, and claims 84, 86, 88, and 90 to provide specific, descriptive recitations.

Finally, applicant has added claims 95-105. Claims 95-105 are device claims corresponding exactly to allowed method claims 18-28.

Thus this application now contains claims 18 to 28 and 44 to 105.

The table below gives an overview of all the claims showing their present status or history.

CLAIM TABLE

Claim	Present Status Or History
1	Incorporated In Claims 44 And 56
2	Canceled and Rewritten As Claims 45 And 57
3	Canceled and Rewritten As Claims 46 And 58
4	Canceled and Rewritten As Claims 47 And 59
5	Canceled and Rewritten As Claims 48 And 60
6	Canceled and Rewritten As Claims 49 And 61
7	Canceled and Rewritten As Independent Claim 44
8	Canceled and Rewritten As Claim 50
9	Canceled and Rewritten As Claim 51
10	Canceled and Rewritten As Claim 52
11	Canceled and Rewritten As Claim 53
12	Canceled and Rewritten As Claim 54
13	Canceled and Rewritten As Claim 62
14	Canceled and Rewritten As Claim 63
15	Canceled and Rewritten As Independent Claim 56
16	Canceled and Rewritten As Claim 64
17	Canceled and Rewritten As Claims 55 And 65
18	Allowed
19	Allowed
20	Allowed
21	Allowed
22	Allowed
23	Allowed
24	Allowed
25	Allowed
26	Allowed
27	Allowed
28	Allowed
29	Canceled and Rewritten As Independent Claims 66 And 80
30	Canceled and Incorporated In Claim 80
31	Canceled and Rewritten As Claims 67 And 81
32	Canceled and Incorporated In Claims 66 And 80
33	Canceled and Rewritten As Claims 68 And 82
34	Canceled and Rewritten As Claims 69 And 83
35	Canceled and Rewritten As Claims 71 And 85
36	Canceled and Rewritten As Claims 74 And 89
37	Canceled and Rewritten As Claims 77 And 92
38	Canceled and Rewritten As Claims 78 And 93
39	Canceled and Rewritten As Claims 79 And 94
40	Canceled
41	Canceled
42	Canceled
43	Canceled
44	Rewrite Of Claim 7
45	Rewrite Of Claim 2

Claim	Present Status Or History
46	Rewrite Of Claim 3
47	Rewrite Of Claim 4
48	Rewrite Of Claim 5
49	Rewrite Of Claim 6
50	Rewrite Of Claim 8
51	Rewrite Of Claim 9
52	Rewrite Of Claim 10
53	Rewrite Of Claim 11
54	Rewrite Of Claim 12
55	Rewrite Of Claim 17
56	Rewrite Of Claim 15
57	Rewrite Of Claim 2
58	Rewrite Of Claim 3
59	Rewrite Of Claim 4
60	Rewrite Of Claim 5
61	Rewrite Of Claim 6
62	Rewrite Of Claim 13
63	Rewrite Of Claim 14
64	Rewrite Of Claim 16
65	Rewrite Of Claim 17
66	Rewrite Of Claim 29
67	Rewrite Of Claim 31
68	Rewrite Of Claim 33
69	Rewrite Of Claim 34
70	New Claim Which Provides A Specific, Descriptive Recitation
71	Rewrite Of Claim 35
72	New Claim Which Provides A Specific, Descriptive Recitation
73	New Claim Which Explains And Reifies Claim 66
74	Rewrite Of Claim 36
75	New Claim Which Provides A Specific, Descriptive Recitation
76	New Claim Which Recites An Other Element Of The Invention
77	Rewrite Of Claim 37
78	Rewrite Of Claim 38
79	Rewrite Of Claim 39
80	Rewrite Of Claim 29
81	Rewrite Of Claim 31
82	Rewrite Of Claim 33
83	Rewrite Of Claim 34
84	New Claim Which Provides A Specific, Descriptive Recitation
85	Rewrite Of Claim 35
86	New Claim Which Provides A Specific, Descriptive Recitation
87	New Claim Which Recites An Other Element Of The Invention
88	New Claim Which Provides A Specific, Descriptive Recitation
89	Rewrite Of Claim 36
90	New Claim Which Provides A Specific, Descriptive Recitation
91	New Claim Which Recites An Other Element Of The Invention
92	Rewrite Of Claim 37

Claim	Present Status Or History
93	Rewrite Of Claim 38
94	Rewrite Of Claim 39
95	New Device Claim Corresponding To Method Claim 18
96	New Device Claim Corresponding To Method Claim 19
97	New Device Claim Corresponding To Method Claim 20
98	New Device Claim Corresponding To Method Claim 21
99	New Device Claim Corresponding To Method Claim 22
100	New Device Claim Corresponding To Method Claim 23
101	New Device Claim Corresponding To Method Claim 24
102	New Device Claim Corresponding To Method Claim 25
103	New Device Claim Corresponding To Method Claim 26
104	New Device Claim Corresponding To Method Claim 27
105	New Device Claim Corresponding To Method Claim 28

THE REJECTIONS UNDER §102 ON MAILMAN

Claims 1-4 and 13-14 were rejected as anticipated by Mailman under §102.

Claim 1

Claim 1 has been canceled. Its dependent claims 7 and 15 have been rewritten as new independent claims 44 and 56, as suggested in the Office Action in the statement of reasons for the indication of allowable subject matter.

The rejection stated that Mailman discloses a method comprising a manual input means by which an operator can generate inputs by entering chords, and comprising a legend presenting indicia representing inputs arranged in groups representing a specific digit. However, **Mailman does <u>not</u> disclose a method of presenting a legend comprising indicia arranged in groups representing a specific digit** (as explained below). Applicant nevertheless has adapted the claims to distinguish more clearly over the prior art.

<u>Applicant's Invention</u>

Applicant's invention is a method and apparatus using a manual input means by which an operator can generate inputs by entering chords. It comprises presenting a legend in which indicia representing inputs are arranged in an array. Rows along one or two dimensions of the array represent specific digits of the human hands. The rows are arranged so that the operator can directly associate the rows with respective digits of the operator, thus mapping indicia of the rows to the digits. Rows along the second dimension either represent a specific digit or correspond to a specific type of chord.

Mailman

Mailman discloses a method comprising a one-handed input device and a system to present user application input choices. The user selects inputs by entering chords. A window displays one of a number of grids which associate chords with user application inputs (see Figs 5 and 7, and col. 5, lines 26-32). A grid is a 4x8 arrangement of 32 blocks (see Fig. 5, and col. 5, lines 35-36). A block comprises a row of 5 rectangles indicating a chord, and a selection cell indicating what will happen if the chord is entered (see Fig. 6, and col. 5, lines 38-42). If the selection cell contains an input, such as a text character, that input is sent to the user application. If the selection cell contains the name of a different grid, that successor grid replaces the current grid (see col. 6, lines 66-67, and col. 7, lines 1-4).

Mailman represents a chord by 5 finger cells, as described above. "In each chord block the finger cells are either dark or clear. A dark finger cell indicates a finger to be pressed and released. A clear finger cell indicates an unpressed finger" (see column 5, lines 43-46, and figure 6). Thus Mailman uses the same two indicia (dark and clear) for each finger cell, and the indicia have the same color (dark or clear) as the rest of a grid.

Applicant's Claimed Invention Is Different From Mailman

The rejection stated that Mailman provides "a legend presenting a plurality of first indicia representing said plurality of inputs (see Fig. 20)". (Fig. 20 however shows "TwinBridge prompt windows" (see col. 3, line 27) which are not part of the invention of Mailman. The prompt windows are part of "TwinBridge Software Corporation's Chinese Partner®", which is used by Mailman as an "Example Keyboard Implementation" of a "popular pinyin-based input method" (see col. 12, lines 14-21). The TwinBridge software is used with a standard computer keyboard.) **The 5 prompt windows** shown in Fig. 20 each are a "different set of ten hanzi", **which are individually displayed as an alternative to the prompt window** shown in Fig. 19 **by using the arrow keys of a standard computer keyboard**: "If the hanzi is not displayed on the first prompt screen, then the arrow keys must be used to display a different set of ten hanzi with the same pronunciation within the prompt window (Fig. 20). When the hanzi does appear, one of the ten function keys is used to select it" (see col. 12, lines 22-31). **Thus applicant submits that the Mailman reference does not teach what the Office Action relies upon it as supposedly teaching.**

Mailman's grids do not have groups which represent a specific digit. Mailman simply orders the chords as the 31 binary numbers 00001 to 11111 they correspond to, starting from the left with the first row, and ending with the last row in the right lower corner (see Fig. 5). By contrast, applicant's

manual input system presents an array with rows representing a specific digit or corresponding to a specific type of chord. Claims 44 and 56 both recite these novel physical features not present in Mailman.

Claim 44, clause (b), clearly distinguishes over Mailman under §102, since it recites:

"a first plurality of said plurality of first indicia arranged substantially in an array of diagonal rows, each of said rows representing a specific digit, each chord corresponding to a specific row of said rows comprising a specific switch of said switches, the switch corresponding to the digit represented by the row, said rows arranged so that said operator can associate said rows directly with said respective digits, thereby mapping each first indicium of each of said rows to the digit represented by the row".

This clause clearly distinguishes over Mailman because his system lacks rows representing a specific digit.

Claim 56, clause (b), clearly distinguishes over Mailman under §102, since it recites:

"a plurality of said plurality of first indicia arranged substantially in an array, said array comprising:

(1) a plurality of first rows along a first dimension, each of said first rows representing a specific digit, each chord corresponding to a specific row of said first rows comprising a specific switch of said switches, the switch corresponding to the digit represented by the row, said first rows arranged so that said operator can associate said first rows directly with said respective digits, thereby mapping each first indicium of each of said first rows to the digit represented by the row, and

(2) a plurality of second rows along a second dimension, said first indicia of each of said second rows corresponding to a specific type of chord".

This clause also clearly distinguishes over Mailman because his system lacks rows representing a specific digit or corresponding to a specific type of chord.

Thus applicant's invention, as recited in claims 44 and 56, clearly recites novel subject matter over Mailman under §102.

Applicant's Claimed Novel Features Are Unobvious and Hence Patentable Over Mailman

Applicant submits that the novel physical features of claims 44 and 56 are also unobvious and hence patentable under §103 since they produce new and unexpected results over Mailman. The new and unexpected results are that **an operator can determine *two* digits corresponding to an input by visualizing the position of a representing indicium,** or determine *one* digit by visualization and determine the specific type of chord by knowing the row of the representing indicium. The new and unexpected results make applicant's manual input system superior to Mailman, and other predecessors.

The first "whereby" clause of claim 44 recites the new and unexpected results as follows:

> "whereby (1) said operator can easily determine two of said digits corresponding to each indicium of said first plurality by visualizing the position of the indicium relative to said rows".

The first and second "whereby" clause of claim 56 recites the new and unexpected results as follows:

> "whereby (1) said operator can easily determine one of said digits corresponding to each indicium of said plurality of said plurality of first indicia by visualizing the position of the indicium relative to said first rows, (2) said operator can easily determine the type of chord corresponding to said first indicia of said first rows by knowing the row of said second rows of the indicium".

Thus applicant's invention as claimed has novel physical features (§102) and these novel physical features produce new, unexpected, and superior results that make these features patentable over Mailman under §103.

Other reasons militate in favor of patentability.

Applicant's manual input system provides an alternative to the standard qwerty computer keyboard. The need for **a better alternative to the qwerty keyboard** has long been felt and has long existed, as evidenced by the Dvorak keyboard (U.S. Pat. No. 2,040,248 to A. Dvorak and W. L. Dealey, 1936). **Thus applicant's invention solves a long-felt, long-existing, but unsolved need.**

Applicant's manual input system has been compared to the standard computer keyboard and the Microwriter chord keyboard (U.S. Pat. No. 4,442,506 to C. Endfield, 1984) **by Dr. Paul Record** (p.record@hw.ac.uk) of Electrical, Electronic & Computer Engineering---School of Engineering

and Physical Sciences, Heriot-Watt University, Edinburgh, Scotland. Applicant received the following by E-mail on Thursday, August 26, 2004 from Dr. Paul Record: "We have done the research, in which we compared your keyboard with a micro-writer type single handed kb and the conventional qwerty using 16 students. I would like to discus the detail. **I am hoping to collate a paper on it soon." Thus Dr. Paul Record has chosen to copy and implement the invention, rather than using the techniques of the prior art. Applicant's invention has accordingly been professionally recognized and will most probably appear in a scientific publication in the nearby future.**

Summary of Arguments Against the Rejection of Claims 44 and 56

In conclusion, the Mailman reference does not teach what the Office Action relies upon it as supposedly teaching, and applicant's invention is generally different from Mailman. Applicant's invention has a new and unexpected result, and is superior to Mailman, solves a long-felt, long-existing, but unsolved need, has been professionally recognized, has been copied and implemented, and will most probably appear in a scientific publication in the nearby future.

Applicant therefore submits that claims 44 and 56 contain novel features which distinguish over Mailman under §102 and are patentable over Mailman under §103.

Claim 2

The rejection stated that the indicia are symbols found on a standard computer keyboard. Claim 2 has been rewritten as new claims 45 and 57 that depend respectively on claims 44 and 56 and add that the indicia are symbols found on a standard computer keyboard. Therefore they *a fortiori* clearly distinguish over Mailman under §102, and have novel physical features which are unobvious and hence patentable under §103. Applicant has also added a "whereby" clause to emphasize that applicant's manual input system, unlike Mailman, is an alternative to the standard computer keyboard.

In addition, claims 45 and 57 are also independently patentable over Mailman. The rejection stated that Mailman discloses the method of Claim 1, including that the indicia are symbols found on a standard computer keyboard (Fig. 20). However, Mailman does not disclose the method of claims 45 and 57, as described above, and his **Fig. 20 does not show indicia representing inputs which are symbols found on a standard computer keyboard**, as described above. **Thus the Mailman reference does not teach what the Office Action relies upon it as supposedly teaching.**

Mailman does show and describe an application by which symbols found on a standard computer keyboard can be input (see Fig. 10, and col. 7, lines 8-17). But, **the application is not intended to replace the standard computer keyboard** (see col. 9, lines 35-38). By contrast, applicant's manual input system is intended to replace the standard computer keyboard. Claims 45 and 57 recite this: "said first indicia are symbols found on a standard computer keyboard". **Thus applicant's invention solves a different problem than the reference, and such different problem is recited in the claims. In re Wright, 6 USPQ 2d 1959 (1988).**

Summary of Arguments Against the Rejection of Claims 45 and 57

Applicant's invention is generally different from Mailman, and has a new and unexpected result and is superior to Mailman. The Mailman reference does not teach what the Office Action relies upon it as supposedly teaching. And applicant's invention solves a different problem than the reference, and such different problem is recited in the claims.

Applicant therefore submits that claims 45 and 57 are *a fortiori* and independently patentable over Mailman.

Claim 3

The rejection stated that Mailman discloses in Figs 4-5 that each chord corresponds to a specific group of indicia that comprises exactly one switch corresponding to a finger of a particular hand, the switch corresponding to the finger represented by the group. Claim 3 has been rewritten as new claims 46 and 58.

Claims 46 and 58 depend respectively on claims 44 and 56 and add that each chord corresponding to a specific row comprises exactly one switch corresponding to a finger of a particular hand of the operator, the switch corresponding to the finger represented by the row. Therefore they *a fortiori* clearly distinguish over Mailman under §102, and have novel physical features which are unobvious and hence patentable under §103.

In addition, claims 46 and 58 are also independently patentable over Mailman. The rejection stated that Mailman discloses in Figs 4-5 that each chord corresponds to a specific group of indicia that comprises exactly one switch corresponding to a finger of a particular hand, the switch corresponding to the finger represented by the group. However, **Mailman does <u>not</u> disclose a group of indicia comprising exactly one switch corresponding to a finger of a particular hand.** Unlike applicant's manual input system in which chords corresponding to rows comprise exactly

one switch corresponding to a finger of a particular hand, Mailman's grids do not have groups comprising exactly one switch operated by a finger of a particular hand (see Fig. 5). Mailman uses a one-handed input device, as described above. **With a one-handed input device there is only a single chord comprising exactly one switch operated by a finger of a particular hand,** one for each finger. Obviously a single chord cannot be grouped. The 4 single chords, one for each finger, in Mailman's grids correspond to the binary numbers 00010, 00100, 01000, and 10000 (see Fig. 6, and col. 5, lines 4-22 and 43-53). **Thus the Mailman reference does not teach what the Office Action relies upon it as supposedly teaching.**

Summary of Arguments Against the Rejection of Claims 46 and 58

Applicant's invention is generally different from Mailman, and has a new and unexpected result and is superior to Mailman. And the Mailman reference does not teach what the Office Action relies upon it as supposedly teaching. Applicant therefore submits that claims 46 and 58 are *a fortiori* and independently patentable over Mailman.

Claim 4

The rejection stated that Mailman discloses that the groups of indicia are labeled with second indicia indicating digits represented by the groups. Claim 4 has been rewritten as new claims 47 and 59.

Claims 47 and 59 depend respectively on claims 44 and 56 and recite that the rows of indicia are labeled with respective second indicia, the second indicia indicating the digits represented by the rows. Therefore they *a fortiori* clearly distinguish over Mailman under §102, and have novel physical features which are unobvious and hence patentable under §103.

In addition, claims 47 and 59 are also independently patentable over Mailman. The rejection stated that Mailman discloses that the groups of indicia are labeled with second indicia indicating digits represented by the groups (Fig. 20). However, **Mailman does <u>not</u> disclose groups of indicia labeled with second indicia indicating digits represented by the groups.** Fig. 20 shows "TwinBridge prompt windows" that are not part of the invention of Mailman, as described above. Unlike applicant's manual input system in which rows of indicia are labeled with colored areas indicating digits represented by the rows, **Mailman's grids do <u>not</u> have groups of indicia representing digits,** as described above. **Thus the Mailman reference does not teach what the Office Action relies upon it as supposedly teaching.**

Summary of Arguments Against the Rejection of Claims 47 and 59

Applicant's invention is generally different from Mailman, and has a new and unexpected result and is superior to Mailman. And the Mailman reference does not teach what the Office Action relies upon it as supposedly teaching. Applicant therefore submits that claims 47 and 59 are *a fortiori* and independently patentable over Mailman.

Claim 13

The rejection stated that Mailman discloses in Fig. 20 that indicia are arranged in columns, each being one of the groups. Claim 13 has been rewritten as new claim 62.

Claim 62 depends on claim 56 and recites that the first rows are columns, each of the columns being one of the first rows. Therefore it *a fortiori* clearly distinguishes over Mailman under §102, and has novel physical features which are unobvious and hence patentable under §103.

In addition, claim 62 is also independently patentable over Mailman. The rejection stated that Mailman discloses in Fig. 20 that indicia are arranged in columns, each being one of the groups. However, **Mailman does not disclose indicia arranged in columns, each being one of the groups, and each group representing a specific digit. Fig. 20 shows "TwinBridge prompt windows" not part of the invention of Mailman**, as described above. The prompt windows are individually displayed as an alternative to the prompt window shown in Fig. 19 by using the arrow keys of a standard computer keyboard, as described above. **Each prompt window is displayed individually and does not show indicia arranged in columns.** Unlike applicant's manual input system, which presents an array with columns representing human digits, **Mailman's grids do not have columns, which represent human digits.** Mailman simply orders the chords as the 31 binary numbers 00001 to 11111 they correspond to, as described above. **Thus the Mailman reference does not teach what the Office Action relies upon it as supposedly teaching.**

Summary of Arguments Against the Rejection of Claim 62

Applicant's invention is generally different from Mailman, and has a new and unexpected result and is superior to Mailman. And the Mailman reference does not teach what the Office Action relies upon it as supposedly teaching. Applicant therefore submits that claim 62 is *a fortiori* and independently patentable over Mailman.

Claim 14

The rejection stated that Mailman discloses that each column is arranged approximately in line with one of the switches (see Fig. 6). Claim 14 has been rewritten as new claim 63.

Claim 63 depends on claim 56 and recites that each of the first rows is arranged approximately in line with one of the switches. Therefore it *a fortiori* clearly distinguishes over Mailman under §102, and has novel physical features which are unobvious and hence patentable under §103.

In addition, claim 63 is also independently patentable over Mailman. The rejection of claim 63 stated that Mailman discloses that each column is arranged approximately in line with one of the switches (see Fig. 6). However, **Mailman does not disclose a column arranged approximately in line with a switch.** Fig. 6 explodes a chord block of a grid and shows the relation between fingers cells and the one-handed input device (see col. 3, lines 3-5). Unlike applicant's manual input system, which presents columns arranged approximately in line with the switches allowing easy determination of digits represented by the columns, **Mailman's grids do not have columns arranged approximately in line with the switches. Thus the Mailman reference does not teach what the Office Action relies upon it as supposedly teaching.**

Mailman's switches are not even arranged along the same dimension as Mailman's finger cells. Switches are arranged vertically, while finger cells are arranged in a horizontal row. This does not allow easy determination of switches represented by finger cells. Mailman needs the exploded view of Fig. 6 precisely because **the relation between the switches and the finger cells is not very clear** without Fig. 6. Without Fig. 6 **the relation is even ambiguous,** namely the finger cells could just as well correspond to the switches in reverse order. **Thus applicant's invention is superior to Mailman.**

Summary of Arguments Against the Rejection of Claim 63

Applicant's invention is generally different from Mailman, and has a new and unexpected result and is superior to Mailman. And the Mailman reference does not teach what the Office Action relies upon it as supposedly teaching. Applicant therefore submits that claim 63 is *a fortiori* and independently patentable over Mailman.

THE REJECTIONS UNDER §103 ON MAILMAN AND WHITCROFT

Claims 5-6, 29-38 and 40-43 were rejected as unpatentable under §103 over Mailman in view of Whitcroft.

Claims 29 and 40

The rejection stated that Mailman discloses in Fig. 6 a method comprising using a manual input means by which an operator can generate inputs by entering chords, and providing a legend indicating a combination of indicia for each input, each indicium representing a specific digit. The rejection further stated that Whitcroft discloses in Fig. 1 that indicia can be colors or tactile indicia, and that it would be obvious to use the colors or tactile indicia of Whitcroft in the system of Mailman, because this would show the user different colored zones and the finger used for each zone.

Claim 29 has been rewritten as new independent claims 66 and 80. Claim 40 has been canceled. In addition, applicant has added a new dependent claim, 73, to reify claim 66. Also applicant has added new dependent claims 76, 87, and 91 to add other elements of the invention, and new dependent claim 88 to provide a specific, descriptive recitation of claim 87.

The rejection stated that Mailman discloses in Fig. 6, a method comprising using a manual input means by which an operator can generate inputs by entering chords, and providing a legend indicating a combination of indicia for each input, each indicium representing a specific digit. The rejection further stated that Whitcroft discloses in Fig. 1 that indicia can be colors or tactile indicia, and that it would be obvious to use the colors or tactile indicia of Whitcroft in the system of Mailman, because this would show the user different colored zones and the finger used for each zone. However, **using the colors of Whitcroft in the system of Mailman would not show the user different colored zones and the finger used for each zone** (as explained below). Applicant nevertheless has revised the claims to distinguish more clearly over the prior art, including Mailman in view of Whitcroft.

Applicant's Invention

Applicant discloses a method comprising a manual input means having switches by which an operator can generate inputs by entering chords, and providing a legend indicating for each input a combination of colors representing the chord corresponding to the input, each color representing a specific digit. Applicant discloses in addition that the colors are linked to the digits in two ways: (1) **the colors are directly linked to the digits by indicia self-explanatory representing the digits, and (2) the colors are linked via the switches to the digits by colors on the switches.**

Mailman is discussed above.

Whitcroft

Whitcroft discloses manual input means with keys arranged in zones for operation by corresponding fingers, the zones colored according to the spectrum of light (see abstract).

There Is No Obvious Reason To Combine Mailman And Whitcroft

Neither Mailman nor Whitcroft suggest (expressly or by implication) that they can be combined, much less in the manner suggested.

Mailman is complete and functional in itself. Whitcroft is also complete and functional in itself. **Thus each reference is complete and functional in itself, so there would be no reason to use parts from or add or substitute parts to any reference.**

Mailman makes use of a nonstandard input device, namely a chord device. Whitcroft uses and attempts to improve the standard computer keyboard. **Thus the references take mutual exclusive paths, namely a chord device versus a standard computer keyboard, and reach different solutions to a similar problem, namely computer input. Since they teach away from each other, it would not be logical to combine them.**

As explained above, Mailman is not intended to replace the standard computer keyboard, while Whitcroft attempts to improve the standard computer keyboard. Mailman states that use of the one-handed input device is desirable only when there is a reason not to use a standard computer keyboard (see col. 9, lines 48-50). **Thus the references themselves teach away (expressly or by implication) from the suggested combination.**

Even If Mailman And Whitcroft Were To Be Combined As Proposed, The Combination Would Not Show All The Novel Physical Features Of Claims 66 and 80

The rejection stated that using the colors or tactile indicia of Whitcroft in the system of Mailman would show the user different colored zones and the finger used for each zone. However, **using the colors of Whitcroft in the grids of Mailman** (see Fig. 5) **would not show the user different colored zones, since columns and rows in Mailman's grids do not correspond to specific fingers,** as described above under "Claim 1". **Thus Mailman does not teach what the Office Action relies upon it as supposedly teaching. The Office Action has therefore not presented a convincing line of reasoning as to why the claimed subject matter as a whole, including its differences over the prior art, would have been obvious.**

Moreover applicant's claims would distinguish over Mailman and Whitcroft even if these references were combined. Using the colors of Whitcroft for the finger cells of Mailman would not link the colors to the operator's digits. By contrast, applicant's manual input system links the colors to the operator's digits directly by accompanying the colors by indicia self-explanatory representing the digits, or via the switches by indicating the colors on the switches. Claims 66 and 80 recite these novel physical features not present in Mailman and Whitcroft.

Claim 66, clause (b), clearly distinguishes over Mailman and Whitcroft, since it recites:

> "said colors accompanied by indicia representing said digits, each of said indicia accompanying a specific color of said colors, the indicium accompanying the color representing the digit represented by the color, said indicia self-explanatory representing said digits, said colors thereby directly linked to said digits".

This distinguishes over Mailman and Whitcroft because the colors are linked directly to the operator's digits by the indicia accompanying the colors and self-explanatory representing the digits.

Claim 80, clause (b), clearly distinguishes over Mailman and Whitcroft, since it recites:

> "said colors representing said digits indicated on said switches, the color on each of said switches representing the digit operating the switch, said colors thereby linked to said digits via said switches".

This distinguishes over Mailman and Whitcroft because the colors are linked to the operator's digits via the switches by indicating the colors on the switches.

Thus even if combined, Mailman and Whitcroft would not meet the claims.

The Novel Physical Features Of Claims 66 And 80 Produce New And Unexpected Results And Hence Are Unobvious And Patentable Over Mailman And Whitcroft Under §103

Applicant submits that the novel physical features of claims 66 and 80 are also unobvious and hence patentable under §103 since they produce new, unexpected, superior, unusual, and surprising results over Mailman and Whitcroft, or any combination thereof. The novel physical features enable one to merely **looking at the manual input system instantaneously see how to operate applicant's manual input system.** The use of colors in combination with linking the colors to the digits makes the manual input system **intuitive and self-explanatory** which is a new, unexpected, and superior result. It is also an unusual and surprising result for a chord system.

The third "whereby" clauses of claim 66 and 80 recites the new and unexpected results as follows:

"(3) said manual input means combined with said legend can be intuitive and self-explanatory".

Thus applicant submits that his invention has a new and unexpected result and is superior to Mailman.

Claims 66 And 80 Are Unobvious Over Mailman And Whitcroft For Additional Reasons

Applicant submits that claims 66 and 80 are also unobvious and hence patentable under §103 over Mailman and Whitcroft, or any combination thereof, for the following reasons:

Applicant's manual input system has a synergetic result, namely by just looking at the manual input system an operator can instantancously see how to operate applicant's manual input system, as described above. The synergetic result is made possible by **using colors to represent digits and combinations of colors to represent chords, in combination with linking the colors to the digits**, as described above. The result of the Mailman reference is that an operator can determine a chord from the finger cells, only after being informed what the finger cells represent. The result of the Whitcroft reference is that an operator can determine the finger operating each key of a standard computer keyboard, since the keys are divided in colored zones. **Thus the whole (that is—the result achieved by the invention) is greater than the sum of its parts (including the respective results of the Mailman and Whitcroft references).**

Unlike applicant's manual input system, **previous chord systems have not used colors to represent specific digits, despite the fact that colors have the advantage that they stand out and can be easily recognized and distinguished**, as witnessed by Whitcroft. (Mailman's finger cells, for example, have the same color as the grid they are part of, as described above.) **Thus if the invention were in fact obvious, because of its advantages, those skilled in the art surely would have implemented it by now. That is, the fact that those skilled in the art have not implemented the invention, despite its great advantages, indicates that it is not obvious.**

Mailman does not suggest that it should be modified in a way which would meet the claims. **Thus the prior art lacks any suggestion that the reference should be modified in a manner required to meet the claims.**

As described above, **applicant's manual input system solves a long-felt, long-existing, but unsolved need, has been professionally recognized and will most probably appear in a**

scientific publication in the nearby future, and Dr. Paul Record has chosen to copy and implement the manual input system, rather than using the techniques of the prior art.

Summary of Arguments Against the Rejection of Claims 66 and 80

Mailman and Whitcroft do not contain any suggestion that they be combined, are complete and functional in themselves, take mutual exclusive paths and reach different solutions to a similar problem, and teach away (expressly or by implication) from the suggested combination.

The Mailman reference does not teach what the Office Action relies upon it as supposedly teaching. The Office Action has not presented a convincing line of reasoning as to why the claimed subject matter as a whole would have been obvious. And even if combined the Mailman and Whitcroft references would not meet the claims.

Applicant's invention has a new and unexpected result and is superior to Mailman and Whitcroft, or any combination thereof.

The result achieved by the invention is greater than the sum of the respective results of the individual references. If the invention were in fact obvious, those skilled in the art surely would have implemented it by now. And the prior art lacks any suggestion that the reference should be modified in a manner required to meet the claims.

Applicant's invention solves a long-felt, long-existing, but unsolved need, has been professionally recognized, has been copied and implemented, and will most probably appear in a scientific publication in the nearby future.

Applicant therefore submits that claims 66 and 80 are patentable over Mailman and Whitcroft.

Claims 5 and 6

The rejection stated that Mailman does not disclose the second indicia are colors, but Whitcroft discloses the second indicia are colors. Claims 5 and 6 have been rewritten respectively as new claims 48 and 49, and also as respectively new claims 60 and 61.

Claims 48 and 49, and also claims 60 and 61 depend respectively on claims 47 and 59 and recite respectively that the second indicia are colors, and that the second indicia are areas shaped like the respective digits. Therefore they *a fortiori* clearly distinguish over Mailman and Whitcroft under §102, and have novel physical features which are unobvious and hence patentable under §103.

In addition, claims 49 and 61 are also independently patentable over Mailman. The rejection stated that Mailman does not disclose the second indicia are colors, but Whitcroft discloses the second indicia are colors. However, **claims 49 and 61 state that the second indicia are areas shaped like the respective digits. Thus regarding claims 49 and 61 the Office Action has not presented a convincing line of reasoning.**

Summary of Arguments Against the Rejection of Claims 48 and 49, and 60 and 61

Applicant's invention is generally different from Mailman, and has a new and unexpected result and is superior to Mailman. And regarding claims 49 and 61 the Office Action has not presented a convincing line of reasoning.

Applicant therefore submits that claims 48, 49, 60, and 61 are *a fortiori* patentable over Mailman and claims 49 and 61 are also independently patentable over Mailman.

Claims 30 and 41

Claim 41 has been canceled and Claim 30 has been incorporated in new claim 80.

The rejection stated that Mailman discloses that indicia representing the digits are on the switches assigned to the digits. However, **Mailman does not disclose indicia on the switches. Thus the Mailman reference does not teach what the Office Action relies upon it as supposedly teaching.** Therefore applicant submits that claim 80 recites novel and patentable subject matter.

Claims 31 and 42

Claim 42 has been canceled. Claim 31 has been rewritten as new claims 67 and 81. Claims 67 and 81 depend respectively on claims 66 and 80 and recite that the switches are keys. Therefore they *a fortiori* clearly distinguish over Mailman and Whitcroft under §102, and have novel physical features which are unobvious and hence patentable under §103. Applicant therefore submits that claims 67 and 80 are *a fortiori* patentable over Whitcroft and Mailman.

Claims 32 and 43

Claim 43 has been canceled. The rejection stated that Whitcroft discloses that the indicia are colors. Claim 32 has been incorporated in new claims 66 and 80 which applicant submits are patentable for the reasons stated under "Claims 29 and 40" above. With respect to the use of colors in applicant's manual input system, the use of colors in combination with linking the colors to the digits makes the

manual input system **intuitive and self-explanatory,** which is a new and unexpected result and which is superior to Mailman and Whitcroft, or any combination thereof.

Claim 33

The rejection stated that Whitcroft discloses colors pink, red, orange, yellow, white, black, green, blue, an inherent purple, and brown corresponding to respective fingers and that it would have been obvious to use the colors of Whitcroft in the system of Mailman, because this would result in different colored zones designating which finger to use in each zone. Claim 33 has been rewritten as new claims 68 and 82.

Claims 68 and 82 depend respectively on claims 66 and 80 and recite that the colors are pink, red, orange, yellow, white, black, green, blue, purple, and brown, corresponding respectively to the left hand little finger, ring finger, middle finger, index finger, thumb, and the right hand thumb, index finger, middle finger, ring finger, and little finger. Therefore they *a fortiori* clearly distinguish over Mailman and Whitcroft under §102, and have novel physical features which are unobvious and hence patentable under §103.

In addition, claims 68 and 82 are also independently patentable over Mailman. The rejection stated that Whitcroft discloses colors pink, red, orange, yellow, white, black, green, blue, an inherent purple, and brown corresponding to respective fingers and that it would have been obvious to use the colors of Whitcroft in the system of Mailman, because this would result in different colored zones designating which finger to use in each zone. However, **using the colors of Whitcroft in the system of Mailman does not result in different colored zones,** as explained above. **Thus the Mailman reference does not teach what the Office Action relies upon it as supposedly teaching.**

Summary of Arguments Against the Rejection of Claims 68 and 82

Applicant's invention has a new and unexpected result and is superior to Mailman and Whitcroft, or any combination thereof. And the Mailman reference does not teach what the Office Action relies upon it as supposedly teaching. Applicant therefore submits that claims 68 and 82 are *a fortiori* and independently patentable over Whitcroft and Mailman.

The Rejection of Claim 34

The rejection stated that Mailman discloses that the indicia form two easily distinguishable groups, one of the groups representing thumbs of the operator, and one of the groups representing fingers of

the operator, the fingers being index, middle, ring, and little fingers. Claim 34 has been rewritten as new claims 69 and 83. In addition, claims 70 and 84 have been added to provide specific, descriptive recitations.

Claims 69 and 83 depend respectively on claims 66 and 80 and recite that the colors form two easily distinguishable groups, one of the groups representing thumbs of the operator, and one of the groups representing fingers of the operator, the fingers being index, middle, ring, and little fingers. Therefore they *a fortiori* clearly distinguish over Mailman and Whitcroft under §102, and have novel physical features which are unobvious and hence patentable under §103.

In addition, claims 69 and 83 are also independently patentable over Mailman. The rejection stated that Mailman discloses that the indicia form two easily distinguishable groups, one of the groups representing thumbs of the operator, and one of the groups representing fingers of the operator, the fingers being index, middle, ring, and little fingers. However, **Mailman does not disclose that the indicia form two easily distinguishable groups, one of the groups representing thumbs of the operator, and one of the groups representing fingers of the operator.** As explained above, Mailman uses five finger cells to represent the digits of one hand. **The finger cell representing the thumb is exactly the same as the four finger cells representing the fingers, i.e. index, middle, ring, and little finger. Clearly these do not form two easily distinguishable groups.** As explained above, the finger cells are even ambiguous, i.e. the left most finger cell could just as well as the right most finger cell represent the thumb, those two possibilities resulting in a different grouping of finger cells representing respectively the thumb and the fingers, i.e. the four other digits. **Thus the Mailman reference does not teach what the Office Action relies upon it as supposedly teaching.**

Summary of Arguments Against the Rejection of Claims 69 and 83

Applicant's invention has a new and unexpected result and is superior to Mailman and Whitcroft, or any combination thereof. And the Mailman reference does not teach what the Office Action relies upon it as supposedly teaching. Applicant therefore submits that claims 69 and 83 are *a fortiori* and independently patentable over Whitcroft and Mailman.

Claim 35

The rejection stated that Mailman discloses that the indicia form two easily distinguishable groups, each of the groups representing a particular hand of the operator. Claim 35 has been revised to make

it clearer, and has been rewritten as new claims 71 and 85. In addition, claims 72 and 86 have been added to provide specific, descriptive recitations.

Claims 71 and 85 depend respectively on claims 66 and 80 and recite that the colors form two easily distinguishable groups, each of the groups representing a particular hand of the operator, one of the groups representing the left hand and one of the groups representing the right hand. Therefore they *a fortiori* clearly distinguish over Mailman and Whitcroft under §102, and have novel physical features which are unobvious and hence patentable under §103.

In addition, claims 71 and 85 are also independently patentable over Mailman. The rejection of claim 35 stated that Mailman discloses that the indicia form two easily distinguishable groups, each of the groups representing a particular hand of the operator. However, **Mailman does not disclose indicia forming two easily distinguishable groups, each of the groups representing a particular hand of the operator. Mailman uses a one-handed input device** and the finger cells represent only the digits of one hand, as described above. **It is therefore impossible for Mailman to have two groups of which each represents a particular hand. Thus the Mailman reference does not teach what the Office Action relies upon it as supposedly teaching.**

Summary of Arguments Against the Rejection of Claims 71 and 85

Applicant's invention has a new and unexpected result and is superior to Mailman and Whitcroft, or any combination thereof. And the Mailman reference does not teach what the Office Action relies upon it as supposedly teaching. Applicant therefore submits that claims 71 and 85 are *a fortiori* and independently patentable over Whitcroft and Mailman.

Claim 36

The rejection stated that Mailman discloses groups of a specific type of combinations of indicia. Claim 36 has been rewritten as new claims 74 and 89. In addition, claims 75 and 90 have been added to provide specific, descriptive recitations.

Claims 74 and 89 depend respectively on claims 66 and 80 and recite that a plurality of the combinations of colors are arranged in groups, the combinations of each of the groups being a specific type of combination. Therefore they *a fortiori* clearly distinguish over Mailman and Whitcroft under §102, and have novel physical features which are unobvious and hence patentable under §103.

In addition, claims 74 and 89 are also independently patentable over Mailman. The rejection stated that Mailman discloses groups of a specific type of combinations of indicia. However, **Mailman does not disclose groups of a specific type of combinations of indicia.** As described above, **Mailman does not group chord representations of a specific type.** Mailman simply orders the chords as the 31 binary numbers 00001 to 11111, as explained above. **Thus the Mailman reference does not teach what the Office Action relies upon it as supposedly teaching.**

Summary of Arguments Against the Rejection of Claims 74 and 89

Applicant's invention has a new and unexpected result and is superior to Mailman and Whitcroft, or any combination thereof. And the Mailman reference does not teach what the Office Action relies upon it as supposedly teaching. Applicant therefore submits that claims 74 and 89 are *a fortiori* and independently patentable over Whitcroft and Mailman.

Claim 37

The rejection stated that Mailman discloses that indicia representing inputs and combinations of indicia are grouped in pairs, each pair pairing a combination to an indicium representing an input, such that entering the corresponding chord generates the corresponding input.

Claim 37 has been rewritten as new claims 77 and 92. Claims 77 and 92 depend respectively on claims 66 and 80 and recite that a first set of indicia representing the inputs and a second set of the combinations of colors are grouped in pairs, each of the pairs pairing one combination of the second set to one of the indicia of the first set, such that entering the chord corresponding to each pair of the pairs generates the input corresponding to the pair. Therefore they *a fortiori* clearly distinguish over Mailman and Whitcroft under §102, and have novel physical features which are unobvious and hence patentable under §103. Applicant therefore submits that claims 77 and 92 are *a fortiori* patentable over Whitcroft and Mailman.

Claim 38

The rejection stated that Mailman discloses that each combination of indicia is arranged in at least one group representing fingers of: a particular hand or thumbs

Claim 38 has been rewritten as new claims 78 and 93. Claims 78 and 93 depend respectively on claims 66 and 80 and recite that each of the combinations of colors is arranged in at least one group, the group representing the class consisting of the fingers of a particular hand of the operator and the

thumbs of the operator. Therefore they *a fortiori* clearly distinguish over Mailman under §102, and have novel physical features which are unobvious and hence patentable under §103.

In addition, claims 78 and 93 are also independently patentable over Mailman. The rejection stated that Mailman discloses that each combination of indicia is arranged in at least one group representing fingers of: a particular hand or thumbs. However, **claims 78 and 93 state that each combination of indicia is arranged in at least one group representing fingers (that is fingers meaning: digits excluding thumbs) of a particular hand or thumbs.** As described above, Mailman represents each chord by five finger cells. The five finger cells representing a chord are not arranged in a group representing fingers (that is fingers meaning: digits excluding thumbs) of a particular hand or thumbs (see Fig. 6). **Thus applicant respectively submits that the Office Action has not presented a convincing line of reasoning.**

Summary of Arguments Against the Rejection of Claims 78 and 93

Applicant's invention has a new and unexpected result and is superior to Mailman and Whitcroft, or any combination thereof. And the Office Action has not presented a convincing line of reasoning. Applicant therefore submits that claims 78 and 93 are *a fortiori* and independently patentable over Whitcroft and Mailman.

THE OBJECTIONS

The Office Action objected to claims 7-12, 15-17, and 39 as being dependent upon a rejected base claim.

Applicant has rewritten claims 7 and 15 as claims 44 and 56 which applicant submits are patentable for reasons stated above. Claims 8-12 have been rewritten as claims 50-54, which depend on claim 44, and claim 16 has been rewritten as claim 64, which depends on claim 56.

Applicant has rewritten Claim 17 as claims 55 and 65, which depend respectively on claims 44 and 56.

Applicant has rewritten Claim 39 as claims 79 and 94, which depend respectively on base claims 66 and 80, which applicant submits are patentable for reasons stated supra.

CONCLUSION

For all the reasons given above, applicant respectfully submits that all claims now define over the prior art under §102 because they recite novel features over the prior art and that these novel features are of patentable merit under §103 because of the new and unexpected results, namely (1) **chords can be determined by simple visualization, or by visualization and knowing the row of a symbol**, and (2) the system is **intuitive and self-explanatory.** Accordingly, applicant submits that claims 18 to 28 and 44 to 105 are in full condition for allowance, which action applicant respectfully solicits.

CONDITIONAL REQUEST FOR CONSTRUCTIVE ASSISTANCE

Applicant has amended the specification and claims of this application so that they are proper, definite, and define novel structure which is also unobvious. If, for any reason this application is not believed to be in full condition for allowance, applicant respectfully requests the constructive assistance and suggestions of the Examiner pursuant to M.P.E.P. § 706.03(d) and § 707.07(j) in order that the undersigned can place this application in allowable condition as soon as possible and without the need for further proceedings. The Examiner is authorized to make any minor needed corrections.

Certificate of Faxing: I hereby certify that I will fax this Reply to GAU 2674 of the Patent and Trademark Office at (703) 872-9326 on 2004 November 8.

Very respectfully,

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